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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,326	10/14/2005	Liang-Chy Chien	KENT-B-PCT-US	1171
7590 12/10/2008				
Hudak Shunk & Farine Co Suite 307 2020 Front Street, Cuyahoga Falls, OH 44221			EXAMINER DUONG, TAI V	
			ART UNIT	PAPER NUMBER
			2871	
			MAIL DATE	DELIVERY MODE
			12/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/553,326

Applicant(s)

CHIEN ET AL.

Examiner

TAI DUONG

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 23-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-22 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 10/14/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: _____

Applicant's election of Group I (claims 1-22) in the reply filed on 08/25/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 23-50 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 5, 7, 12, 18 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 4 and 7, it is unclear with respect to which reference axis the azimuth angle is determined. In claim 5, the recited feature "said controlled drift thruster" lacks antecedent basis. Claims 12, 18 and 21 are also rejected since they depend on claim 4.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 07-056172 (JP'172) cited by Applicant.

Note the abstract and Fig. 3 which identically disclose the claimed process for preparing an aligning substrate for liquid crystals, comprising the steps of providing an aligning substrate comprising an aligning film 102; and bombarding at least a portion of the substrate with a plasma beam 105 from a plasma beam source at an incident angle about 45 degrees to produce an aligning direction on the aligning substrate (paragraph 0009).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 11, 13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 07-056172 (JP'172) in view of Valentian (US 5,945,781).

As to claim 2, the only difference between the process of JP'172 and that of the instant claim is the plasma beam source being a closed drift thruster. Valentian discloses that it was known to employ a closed drift thruster as the plasma beam source (col. 1, lines 5-33). Thus, it would have been obvious to a person of ordinary skill in the art in view of Valentian to employ in the process of JP'172 a closed drift thruster as the plasma beam source with low ion energy, as compared with ion bombardment thruster.

As to claim 11, the JP'172 impliedly discloses that the liquid crystal is thermotropic (a liquid crystal *displaying* body panel, paragraph 0010) because thermotropic liquid crystals are used in almost of the liquid crystal *displays*.

As to claims 13, 15 and 17, JP'712 discloses in Fig. 3 a mask 103, the plasma beam being in a form sheet due to the linear slit 104 and the aligning substrate being moved through a path of the plasma beam (arrow 107). Thus, it would have been obvious to a person of ordinary skill in the art in view of Valentian to employ in the process of JP'712 a closed drift thruster as the plasma beam source with low ion energy, as compared with ion bombardment thruster.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 07-056172 (JP'172) in view of Sprokel (US 4,261,650).

The only difference between the process of JP'172 and that of the instant claim is the aligning substrate being positioned at a distance of about 5 to about 50 cm from the plasma beam source. Sprokel discloses that the distance between the substrate and the plasma beam source (the ground electrode 42) is a compromise; etching and deposition rates increase as this distance is made shorter, but the effect of the deposition angle decreases (col. 3, lines 34-37). Thus, it would have been obvious to a person of ordinary skill in the art in view of Sprokel to position the aligning substrate at a distance of about 5 to about 50 cm from the plasma beam source for optimizing either the desired deposition rate or the desired deposition angle.

Claims 3, 5-7, 9, 10, 14, 16, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'172 and Valentian as applied to claim 2 above, and further in view of Sprokel (US 4,261,650) and Chaudhari et al (US 6,195,146) cited by Applicant.

As to claims 3 and 5, the only differences between the process cited in the above rejection of claim 2 and that of the instant claims are the current density of the plasma beam being about 0.1 to about 1000 $\mu\text{A}/\text{cm}^2$ and the ion energy being from about 100 to about 5000 eV, and the closed drift thruster being an anode layer thruster. Chaudhari et al disclose that it was known to a plasma beam having a current density being about 100-500 $\mu\text{A}/\text{cm}^2$ and an ion energy being from about 25-200 eV (col. 4, lines 29-52). Valentian discloses that it was known to employ a closed drift thruster being an anode layer thruster (col. 1, lines 27-29).

Thus, it would have been obvious to a person of ordinary skill in the art in view of Chaudhari et al to employ in the process cited in the above rejection of claim 2 a plasma beam having a current density about 0.1 to about 1000 $\mu\text{A}/\text{cm}^2$ and an ion energy being from about 100 to about 5000 eV for obtaining an aligning substrate with alignment similar to that obtained by rubbing with a cloth. Also, it would have been obvious to a person of ordinary skill in the art in view of Valentian et al to employ in the process cited in the above rejection of claim 2 a closed drift thruster being an anode layer thruster for providing a straight and accurate plasma beam, as compared with other ion thrusters and other plasma thrusters.

As to claim 6, JP'172 discloses the aligning film comprising polyimide (abstract).

As to claims 9 and 10, Chaudhari et al disclose the incident angle being about 5 to 85 degrees (col. 4, lines 29-30). Thus, it would have been obvious to a person of ordinary skill in the art in view of Chaudhari et al to employ an incident angle being

about 20 degrees to about 75 degrees or 50 to about 75 degrees for obtaining a desired alignment of the liquid crystal molecules, e.g. parallel or tilted.

Claims 7, 14, 16, 19 and 22 recite similar features as those of claims 4, 13, 15, 17 and 20, respectively. Claims 7, 14, 16 and 19 would have been obvious for the same reasons as those applied to claims 4, 13, 15, 17 and 20.

Claims 4, 12, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'172, Valentian and Chaudhari et al as applied to claim 3 above, and further in view of Spokel (US 4,261,650).

As to claim 4, the only differences between the process cited in the above rejection of claim 3 and that of the instant claim is the bombarded portion of the aligning substrate imparting to a liquid crystal an alignment direction having an azimuth angle of about 90 degrees and a zenithal angle of about 0 degree. Spokel discloses in Figs. 3A-B the bombarded portion of the aligning substrate imparting to a liquid crystal an alignment direction having an azimuth angle of about 90 degrees and a zenithal angle of about 0 degree (col. 4, lines 21-36).

Thus, it would have been obvious to a person of ordinary skill in the art in view of Spokel to impart to a liquid crystal an alignment direction having an azimuth angle of about 90 degrees and a zenithal angle of about 0 degree for obtaining a uniform parallel liquid crystal alignment.

Claims 12, 18 and 21 recite similar features as those of claims 11, 17 and 20, respectively. Claims 12, 18 and 21 would have been obvious for the same reasons as those applied to claims 11, 17 and 20.

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 8 is allowed over the prior art of record because none of the prior discloses or suggests a process having the combination of the process recited in claim 6, in combination with the features "wherein current density of the plasma beam is about 0.5 to about 30 $\mu\text{A}/\text{cm}^2$, and wherein the ion energy is from about 200 to about 700 eV".

Any inquiry concerning this communication should be directed to Tai Duong at telephone number (571) 272-2291.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/TD/
12/08

/Dung Nguyen/
Primary Examiner, Art Unit 2871

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Art Unit: 2871

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